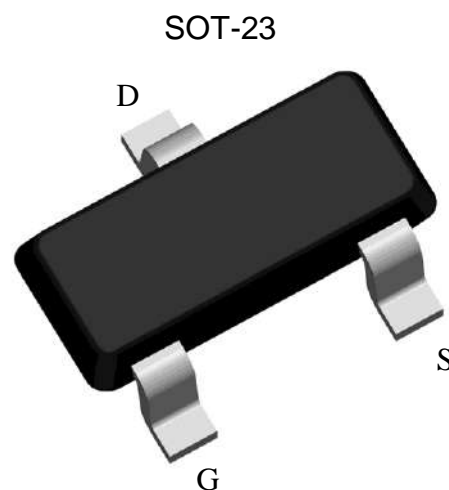


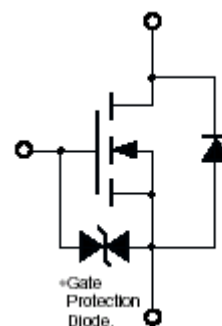
50V N-Channel Enhancement Mode MOSFET

Features:

- Simple drive requirement
- Small package outline
- Pb-free lead plating and halogen-free package



BV _{DSS}	50V
I _D	380mA
R _{DS(on)} @ V _{GS} =10V, I _D =220mA	1.1Ω (typ)
R _{DS(on)} @ V _{GS} =4.5V, I _D =220mA	1.3Ω (typ)
R _{DS(on)} @ V _{GS} =2.5V, I _D =220mA	1.7Ω (typ)
R _{DS(on)} @ V _{GS} =4V, I _D =100mA	1.3Ω (typ)
R _{DS(on)} @ V _{GS} =2.5V, I _D =80mA	1.6Ω (typ)



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
BSS138	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V _{DS}	50	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current @ T _A =25°C, V _{GS} =4.5V (Note 3)		I _D	380	mA
Continuous Drain Current @ T _A =85°C, V _{GS} =4.5V (Note 3)			270	
Pulsed Drain Current (Notes 1, 2)		I _{DM}	1.5	A
Maximum Power Dissipation (Note 3)	T _A =25°C	P _D	350	mW
	T _A =70°C		224	
ESD susceptibility		V _{ESD}	1500 (Note 4)	V
Operating Junction and Storage Temperature		T _j , T _{stg}	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.

2. Pulse width ≤ 300μs, duty cycle ≤ 2%.

3. Surface mounted on FR-4 board.

4. Human body model, 1.5kΩ in series with 100pF

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient(PCB mounted)	R _{th,ja}	357	°C/W

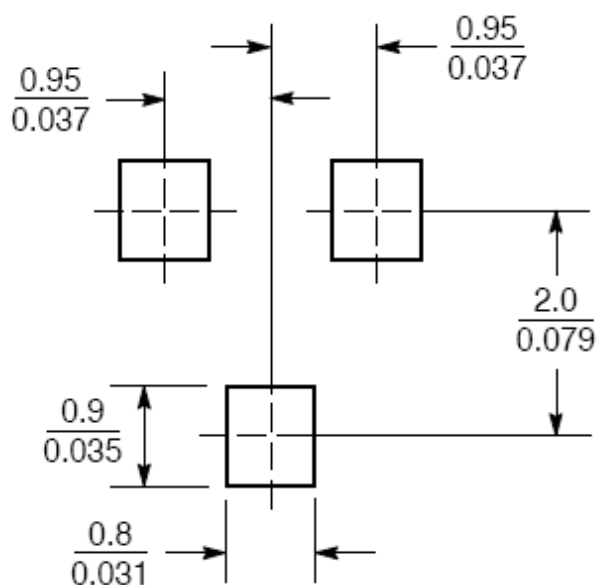
Electrical Characteristics (T_j=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	50	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	0.8	-	1.5		V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =50V, V _{GS} =0V
	-	-	10		V _{DS} =40V, V _{GS} =0V (T _j =70°C)
*R _{DS(ON)}	-	1.1	1.3	Ω	V _{GS} =10V, I _D =220mA
	-	1.3	1.7		V _{GS} =4.5V, I _D =220mA
	-	1.7	5		V _{GS} =2.5V, I _D =220mA
	-	1.3	3		V _{GS} =4V, I _D =100mA
	-	1.6	5		V _{GS} =2.5V, I _D =80mA
*G _{FS}	0.4	0.6	-	S	V _{DS} =10V, I _D =220mA
Dynamic					
C _{iss}	-	43	-	pF	V _{DS} =10V, V _{GS} =0V, f=1MHz
C _{oss}	-	7.2	-		
Cr _{ss}	-	4	-		

t _d (ON)	-	4	-	ns	V _{DS} =30V, I _D =100mA, V _{GS} =4.5V R _G =10Ω
t _r	-	7	-		
t _d (OFF)	-	15	-		
t _f	-	15	-		
Q _g	-	0.76	-	nC	V _{DS} =30V, I _D =250mA, V _{GS} =4.5V
Q _{gs}	-	0.085	-		
Q _{gd}	-	0.26	-		
Source-Drain Diode					
*V _{SD}	-	0.79	1.2	V	V _{GS} =0V, I _S =200mA

*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

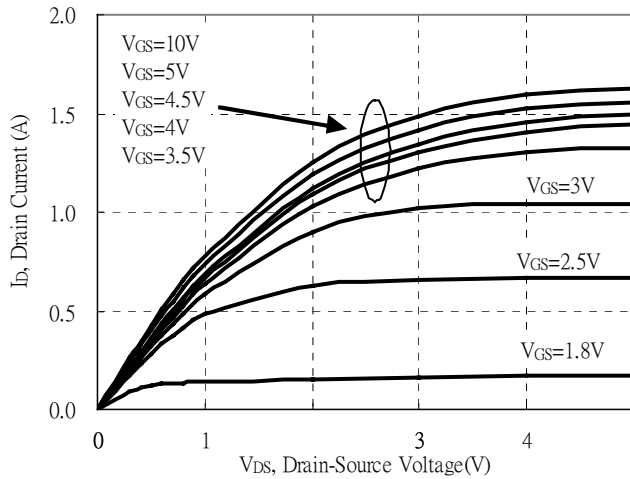
Recommended Soldering Footprint



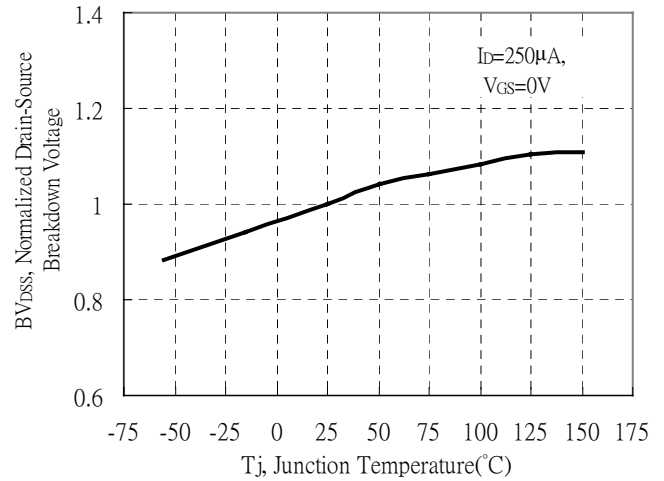
Unit : $\frac{\text{mm}}{\text{inches}}$

Typical Characteristics

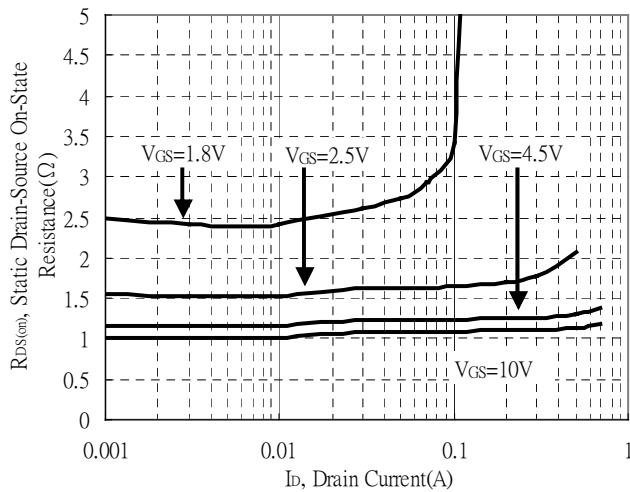
Typical Output Characteristics



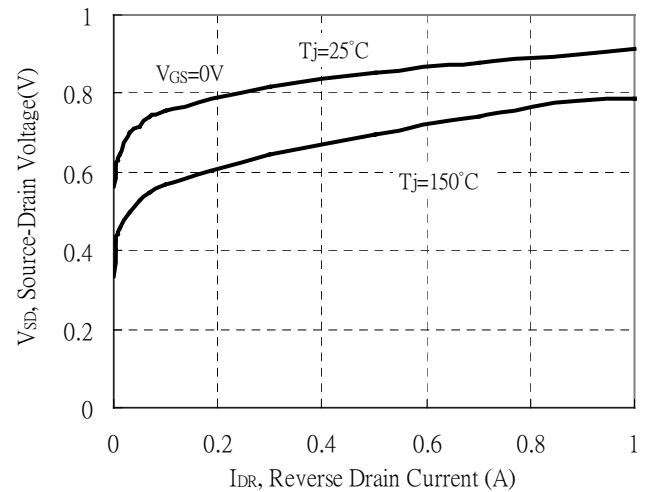
Breakdown Voltage vs Ambient Temperature



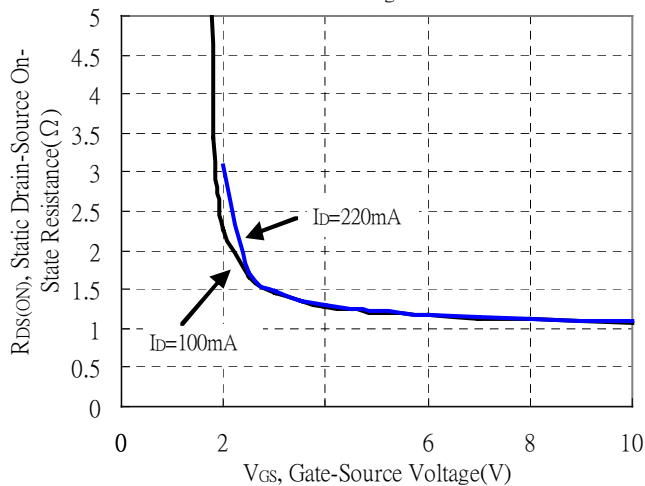
Static Drain-Source On-State resistance vs Drain Current



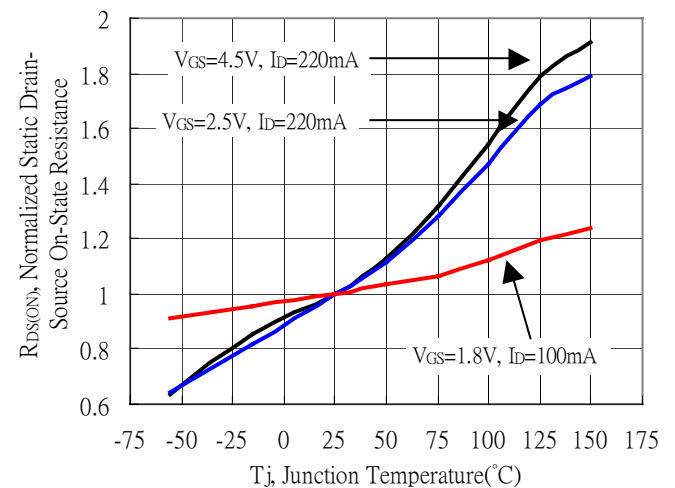
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

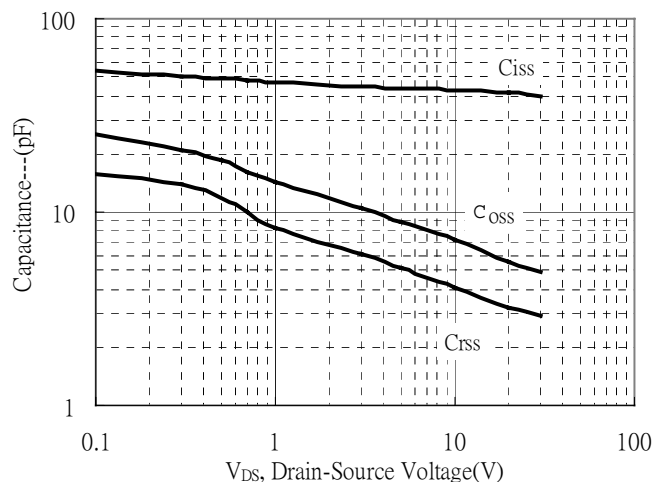


Drain-Source On-State Resistance vs Junction Temperature

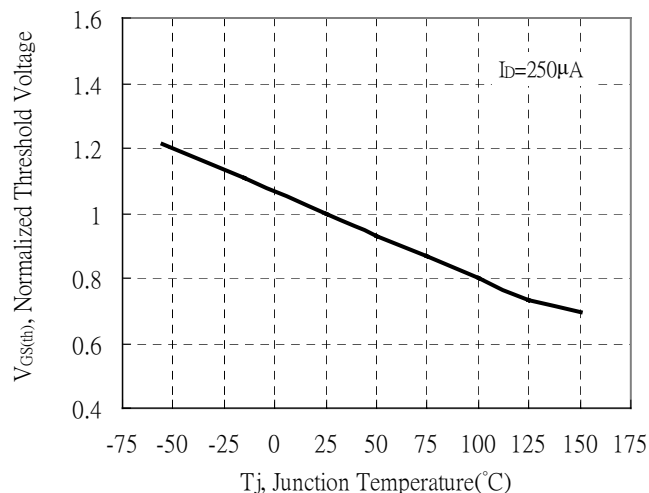


Typical Characteristics(Cont.)

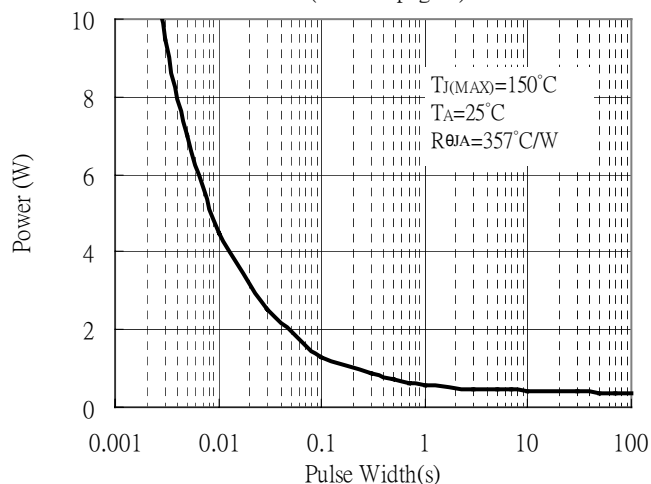
Capacitance vs Drain-to-Source Voltage



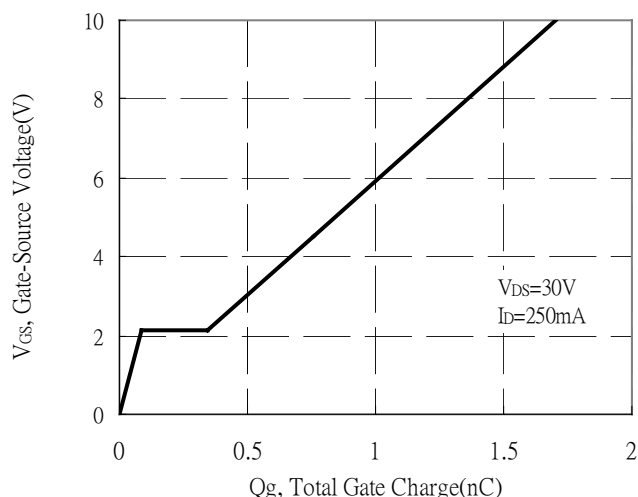
Threshold Voltage vs Junction Temperature



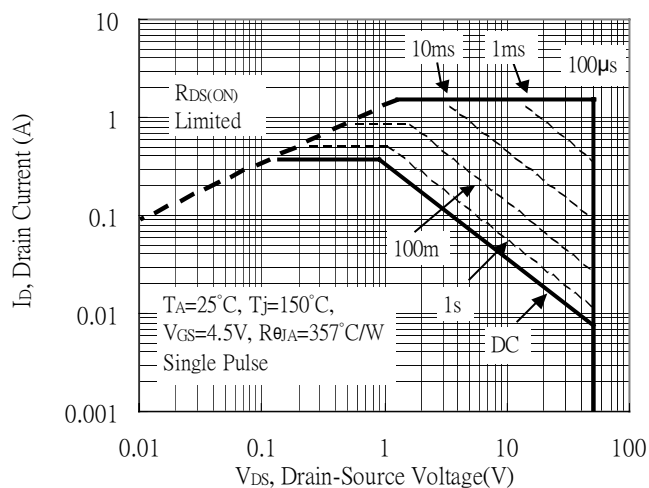
Single Pulse Power Rating, Junction to Ambient
 (Note on page 2)



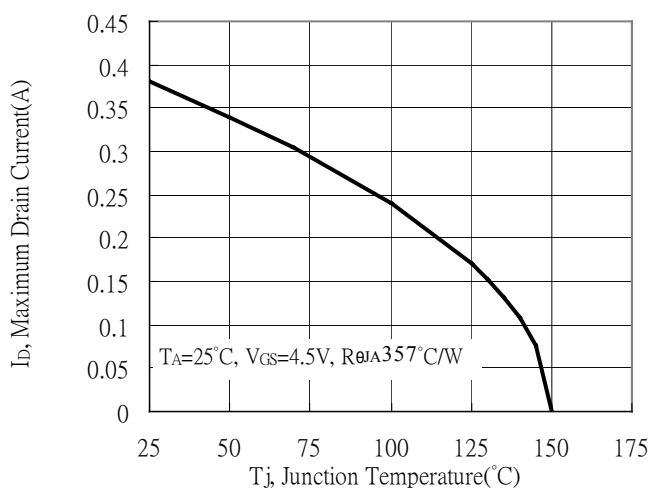
Gate Charge Characteristics



Maximum Safe Operating Area

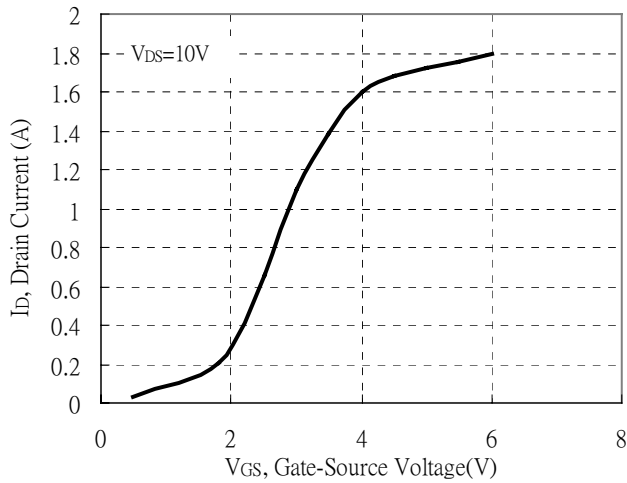


Maximum Drain Current vs Junction Temperature

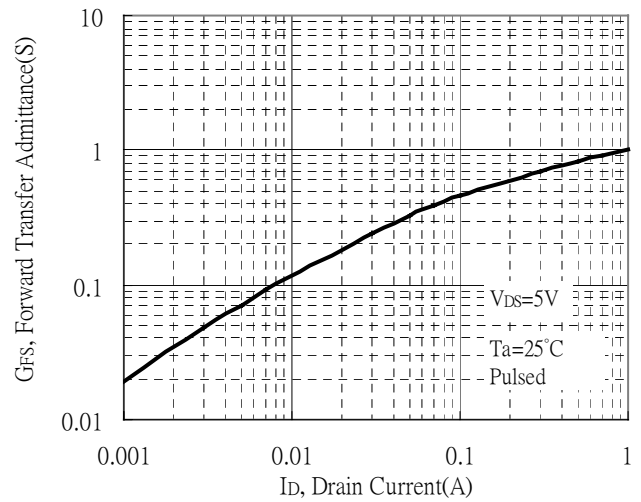


Typical Characteristics(Cont.)

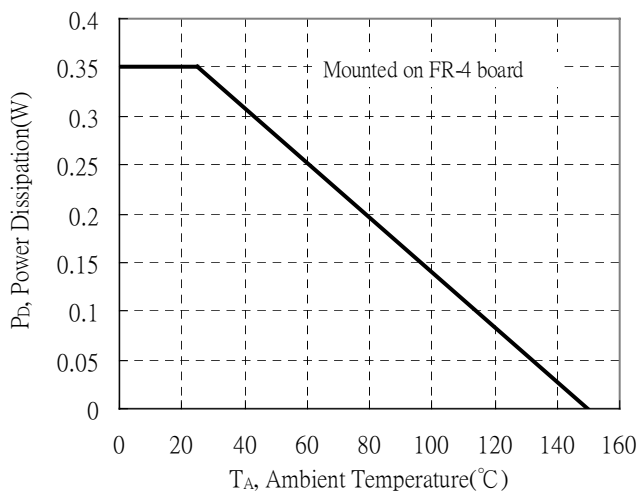
Typical Transfer Characteristics



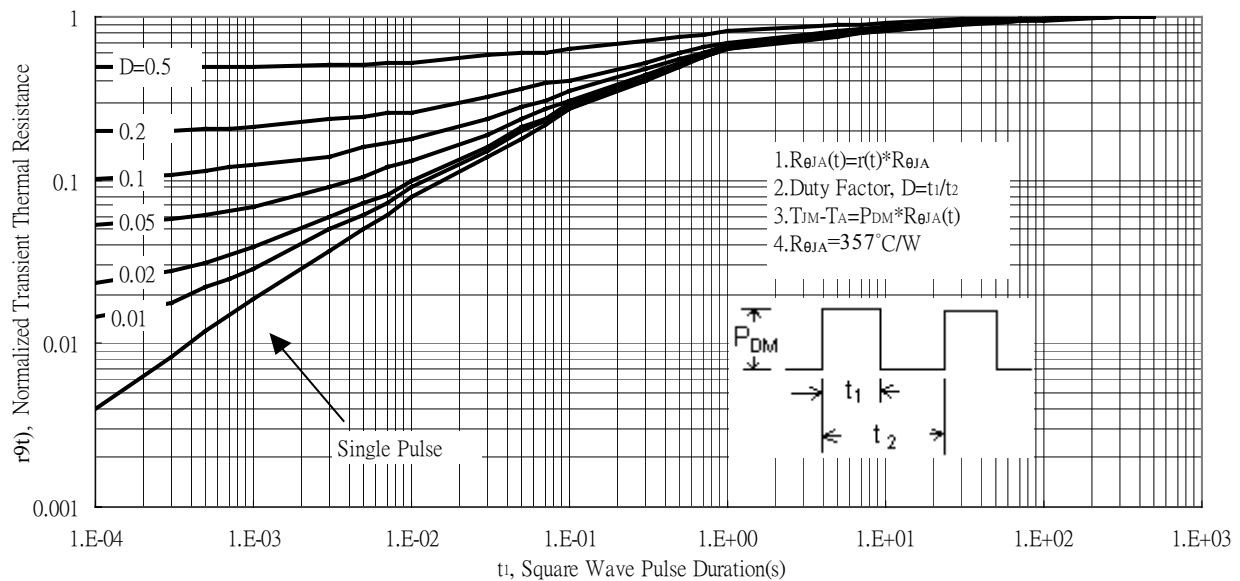
Forward Transfer Admittance vs Drain Current



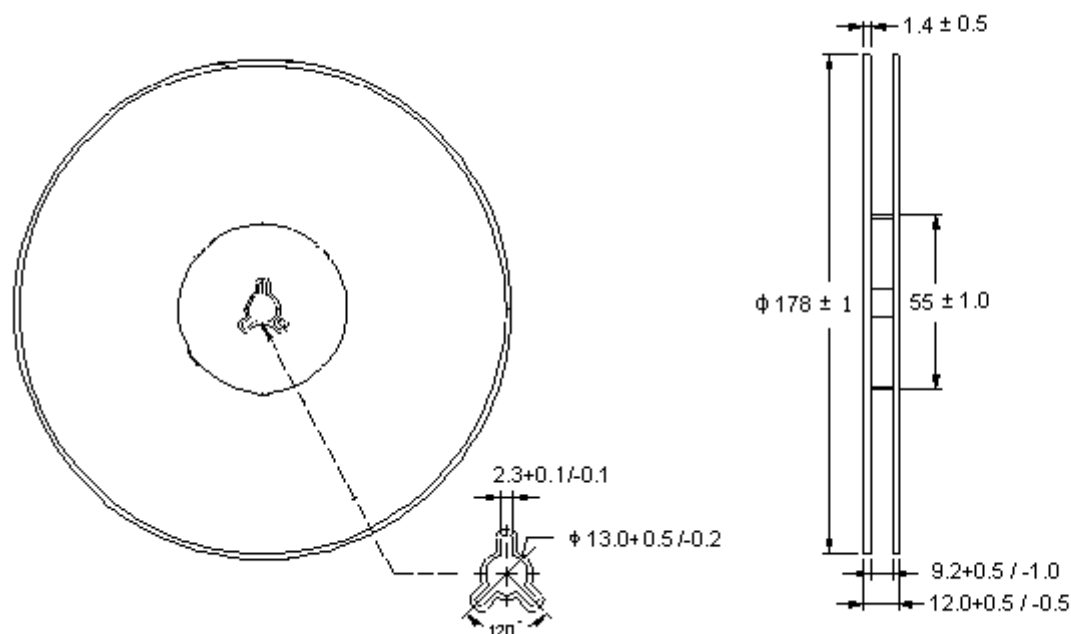
Power Derating Curve



Transient Thermal Response Curves

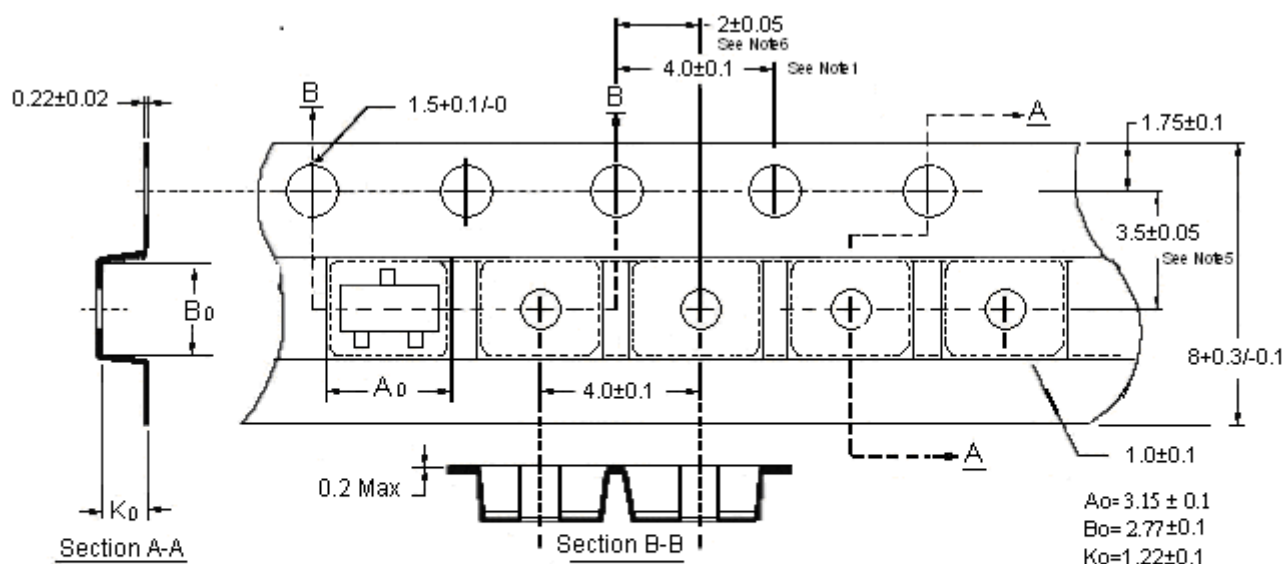


Reel Dimension



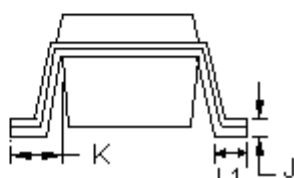
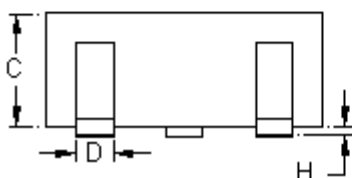
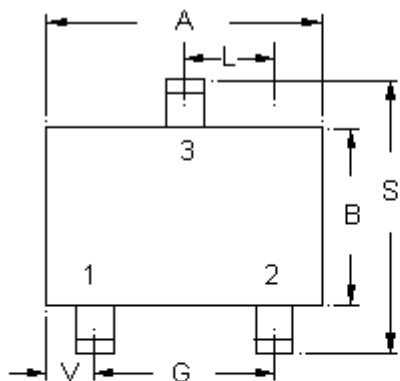
Unit: millimeter

Carrier Tape Dimension

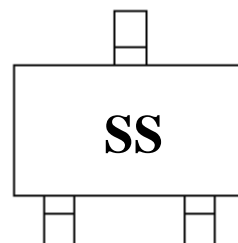


Unit : millimeter

SOT-23 Dimension



Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package

Style : Pin 1.Gate 2.Source 3.Drain

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0551	1.20	1.40	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1004	2.10	2.55
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50